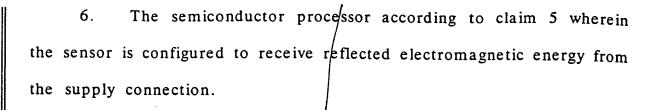
## <u>CLAIMS</u>

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1. A semiconductor processor comprising:

- a process chamber configured to receive a semiconductor workpiece for processing;
- a supply connection in fluid communication with the process chamber and configured to supply slurry to the process chamber; and a sensor configured to monitor the turbidity of the slurry.
- 2. The semiconductor processor according to claim 1 wherein the supply connection is arranged in a substantially horizontal orientation.
- 3. The semiconductor processor according to claim 1 wherein the supply connection is arranged in a substantially vertical orientation.
- 4. The semiconductor processor according to claim 1 wherein the sensor is configured to attach to the supply connection and detach from the supply connection without disruption of the supply of slurry within the supply connection.
- 5. The semiconductor processor according to claim 1 wherein the sensor is configured to emit electromagnetic energy towards the supply connection and to receive at least some of the electromagnetic energy from the supply connection.



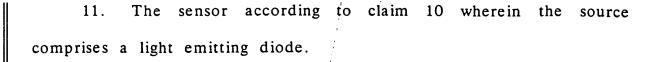


- 7. The semiconductor processor according to claim 1 wherein the sensor is configured to generate a signal indicative of the turbidity of the slurry responsive to the received electromagnetic energy.
- 8. The semiconductor processor according to claim 1 wherein the sensor is substantially insulated from the slurry.
- 9. The semiconductor processor according to claim 1 wherein the process chamber comprises a chemical-mechanical polishing chamber.
  - 10. A sensor comprising:
- a source configured to emit electromagnetic energy towards a subject material;

an initial receiver configured to receive at least some of the electromagnetic energy, the initial receiver being configured to generate a signal indicative of the turbidity of the subject material and responsive to the received electromagnetic energy; and

a housing configured to align the source and initial receiver with respect to the subject material.





- 12. The sensor according to claim 11 wherein the light emitting diode is configured to emit infrared electromagnetic energy.
  - 13. The sensor according to claim 10 further comprising:

another receiver configured to receive at least some of the electromagnetic energy passing through the subject material and to generate a signal indicative of the received electromagnetic energy; and

- a driver configured to control the amount of emitted electromagnetic energy from the source to provide a substantially constant amount of received electromagnetic energy at the another receiver.
- 14. The sensor according to claim 10 wherein the initial receiver is configured to receive emitted electromagnetic energy emitted without passage of the electromagnetic energy through the subject material.
- 15. The sensor according to claim 14 further comprising a beam splitter configured to direct electromagnetic energy from the source to the subject material and to the initial receiver.



- 16. The sensor according to claim 10 wherein the initial receiver is configured to receive emitted electromagnetic energy passed through the subject material.
- 17. The sensor according to claim 10 wherein the sensor is configured to receive reflected electromagnetic energy from the subject material.
- 18. The sensor according to claim 10 wherein the housing is configured to attach to a supply connection containing the subject material and detach from the supply connection without disruption of the flow of subject material within the supply connection.
  - 19. An apparatus comprising:
- a container configured to provide a subject material in a substantially static state; and
- at least one sensor provided at a predefined position relative to the container to monitor the turbidity of the subject material at a desired vertical position of the container.

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	20.	The	appara	tus	acco	rding	to	claim	19	where	in	the	at	leasi
one	sensor	con	prises	a	plura	lity	of	sensor	s p	rovide	d	at	diff	ereni
prede	fined	positi	ons re	lative	e to	the	con	tainer	to	monito	or	the	turl	oidity
of the	e subje	ect m	aterial	at a	plui	rality	of	desired	l ve	rtical	pos	itior	is o	f the
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- 21. The apparatus according to claim 19 wherein the at least one sensor comprises:
- a source configured to emit electromagnetic energy towards the container; and
- configured to receive at least some electromagnetic energy.
  - A semiconductor processor comprising: 22.
- chamber configured to receive and process semiconductor workpiece;
- a connection provided in fluid communication with the process chamber and configured to supply slurry to the process chamber; and
- a sensor configured to monitor the turbidity of the slurry and including:
- a source configured to emit electromagnetic energy towards the connection; and
- a receiver configured to receive at least some of the electromagnetic energy.

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	23.	The	semicondu	ctor	p	rocessor/ a	ccording	to	claim	22	wherein
the	connection	on i	s arranged	in	a	substantia	lly horize	onta	al orie	ntai	tion.

- 24. The semiconductor processor according to claim 22 wherein the connection is arranged in a substantially vertical orientation.
- 25. The semiconductor processor according to claim 22 wherein the sensor is configured to generate a signal indicative of the turbidity responsive to the received electromagnetic energy.
- 26. The semiconductor processor according to claim 22 wherein the sensor is substantially insulated from the slurry.
- 27. The semiconductor processor according to claim 22 further comprising a housing coupled with the connection and configured to align the source and the receiver with respect to the connection.
- 28. The semiconductor processor according to claim 22 wherein the process chamber comprises a chemical-mechanical polishing chamber.
- 29. The semiconductor processor according to claim 22 wherein the connection is transparent.



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- The semiconductor processor, according to claim 22 wherein 30. the connection is translucent.
  - 31. A semiconductor processor system comprising:
  - a distributor configured to supply a slurry;
- process chamber configured to receive process semiconductor workpiece;
- a connection configured to supply slurry from the distributor to the process chamber; and
- a sensor configured to monitor the turbidity of the slurry and including:
- a source configured to/emit electromagnetic energy towards the connection; and
- a receiver configured to receive at least some of the electromagnetic energy.
- The semiconductor processor system according to claim 31 32. wherein the sensor is substantially insulated from the slurry.
- The semiconductor processor system according to claim 31 33. wherein the process chamber comprises a chemical-mechanical polishing chamber.

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34. The semiconductor processor system according to claim 31 wherein the connection is transparent.

35. The semiconductor processor system according to claim 31 wherein the connection is translucent.

36. A semiconductor workpiece processing method comprising: providing a semiconductor process chamber; supplying slurry to the semiconductor process chamber; and monitoring the turbidity of the slurry using a sensor.

- 37. The method according to claim 36 wherein the supplying comprises using a supply connection and the monitoring comprises monitoring slurry within the supply connection.
- 38. The method according to claim 37 further comprising coupling the sensor with the supply connection.
- 39. The method according to claim 36 wherein the monitoring comprises:

emitting electromagnetic energy towards the slurry; and receiving at least some of the electromagnetic energy.

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40.	Th	e m	ethod	accord	ling	to	claim	36	furt	her	compr	ising
generating	a s	ignal	indica	tive of	the	turb	idity	after	the	mon	itoring.	,

- 41. The method according to claim 36 further comprising insulating the slurry from the sensor.
- The method according to claim 36 wherein the providing 42. comprises providing a chemical-mechanical polishing process chamber.
  - A turbidity monitoring method comprising: 43. providing a source;

emitting electromagnetic energy towards subject material using the source;

aligning an initial receiver relative to the subject material; receiving at least some of the electromagnetic energy after the emitting using the initial receiver; and

generating a signal indicative of the turbidity after the receiving.

The method according to claim 43 wherein the emitting 44. comprises emitting infrared electromagnetic energy.



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The method according to claim 43 further comprising: 45. second receiving at least some of the electromagnetic energy passing through the subject material using another receiver; and

controlling the emitting responsive the second receiving to provide a substantially constant amount of received elect/romagnetic energy at the another receiver.

- 46. The method according to claim 45 further comprising directing the emitted electromagnetic energy to the initial receiver and the another receiver.
- 47. The method according to claim 43 wherein the receiving comprises receiving electromagnetic /energy not passing through the subject material.
- 48. The method according to claim 43 wherein the receiving comprises receiving electromagnétic energy passing through the subject material.

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	49. A turbidity monitoring method comprising:
	providing a container;
	providing subject material in a substantially static condition within
the	container;
	monitoring the turbidity of the subject material at a predefined
vert	ical position within the container; and

generating a signal indicative of the turbidity of the subject material after the monitoring.

- 50. The method according to claim 49 further comprising monitoring the turbidity of the subject material at another predefined vertical position within the container.
- 51. The method according to claim 49 wherein the monitoring comprises:

emitting electromagnetic energy towards the subject material; and receiving at least some of the electromagnetic energy.

52. The method according to claim 49 further comprising rotating the subject material during the monitoring.

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A semiconductor workpiece processing method comprising: 53. providing a semiconductor processor having a process chamber configured to receive a semiconductor workpiece;

supplying slurry to the process chamber using a connection: emitting electromagnetic energy towards the connection using a sensor;

receiving at least some of the electromagnetic energy using the sensor; and

generating a signal indicative of turbidity of the slurry responsive to the receiving.

- The method according to claim 53 wherein the emitting 54. comprises emitting infrared electromagnetic energy.
- The method according to claim 53 further comprising 55. substantially insulating the slurry from the sensor.
- The method according to claim 53 wherein the providing 56. polishing semiconductor comprises providing chemical-mechanical processor.
- 57. The method according to claim 53 further comprising attaching the sensor to the connection and detaching the sensor from the connection while maintaining the supplying.

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A semiconductor workpiece processing method comprising: 58.

providing a semiconductor processor having a process chamber configured to receive a semiconductor workpiece;

supplying slurry to the process chamber using a connection;

emitting infrared electromagnetic energy using a source;

splitting the infrared electromagnetic energy to direct some of the infrared electromagnetic energy towards the connection;

first receiving at least some of the infrared electromagnetic energy passing through the connection using a first receiver;

generating a feedback signal using the first receiver responsive to the first receiving;

adjusting the emitting via the source responsive to the feedback signal to provide a substantially constant amount of electromagnetic energy to the first receiver;

second receiving at least some of the infrared electromagnetic energy not passing through the connection using a second receiver; and

generating a signal indicative of turbidity of the slurry using the second receiver responsive to the second receiving.

